Space Weather Forecast

Issued on Sunday 20 October 2024 at 01:09 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Further Moderate flares likely, mainly day 1 (20 Oct). Chance of G1 Minor Storm intervals into the new week.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Moderate with four Moderate class flares, all from a region that is difficult to observe, with its leader spot now moving onto the far-side over the west limb. Including this region, there are nine sunspot groups on the disc. The other regions are relatively simple and stable at this stage.

No Earth-directed CMEs (coronal mass ejections) were observed.

Solar Wind / Geomagnetic Activity: A weak enhancement in the solar wind was likely due to glancing interactions with a region of faster solar winds. Solar winds speeds, increased from near background to slightly elevated, 400 km/s to around 420-470km/s. The Interplanetary Magnetic Field (IMF), Bt, was moderate at first but eased to become generally weak. The important north-south component, Bz, was turbulent and occasionally moderate, but favoured a negative (southward) orientation for much of the period. Geomagnetic activity was Unsettled to Active (Kp3-4), with one period of G1 Minor Storm (19/0000-0300UTC).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at background, with no Solar Radiation Storms occurring.

Four-Day Space Weather Forecast Summary

Solar Activity: Low to Moderate activity is forecast with isolated Moderate flares likely at times. These most likely on day 1 (20 Oct) from the region on the west limb, and late in the period as returning sunspots increasingly rotate onto the disk.

Solar Wind / Geomagnetic Activity: There are no Earth-directed CMEs currently forecast. Geomagnetic activity is forecast to be mainly Quiet to Unsettled initially but with a chance of isolated Active to G1 Minor Storm intervals from any further enhancement from strong solar winds day 1 (20 Oct). A further fast solar wind onset is then expected to bring Active to G1 Minor Storm intervals, perhaps later on day 2 (21 Oct), but more likely on day 3 (22 Oct), before activity is expected to decline into day 4 (23 Oct).

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 370 900 0100 Email: enquiries@metoffice.gov.uk

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Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to persist at background, with no Solar Radiation Storms expected.

Geomagnetic Storms

Geomagnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	Yes	10	20	50	20
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X-Ray Flares

X-Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 (M Class)	Yes	60	30	40	60
Very Active	R3-R5 (X Class)	No	10	5	5	10

Solar Radiation Storms (High Energy Protons)

Radiation Storms Probability (Exceedance)	Level ($cm^{-2}sr^{-1}s^{-1}$)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	5	5	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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